

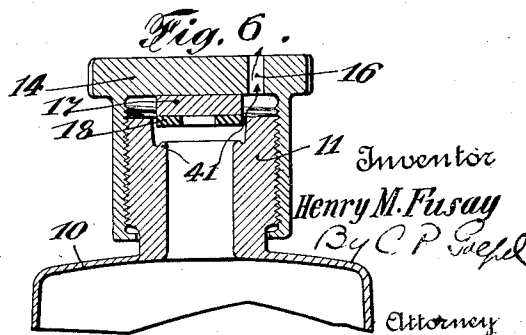
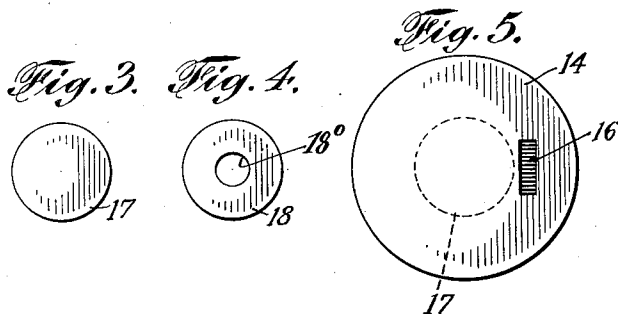
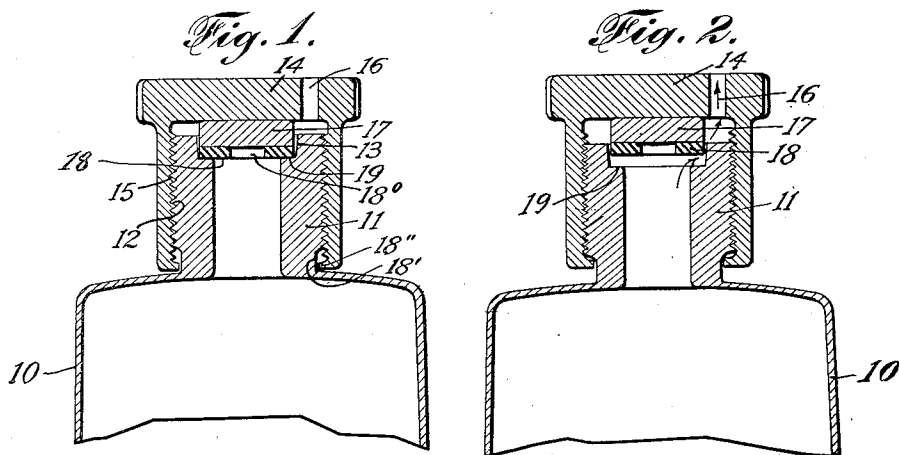
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CLOSURE DEVICE FOR COLLAPSIBLE TUBES AND THE LIKE

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CLOSURE DEVICE FOR COLLAPSIBLE TUBES AND THE LIKE.

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This invention relates to closure devices for collapsible tubes and the like and has for its object to provide an efficient device which will enable the tube to be promptly opened and closed and sealed air-tight without the necessity of removing any part of the device.

A preferred embodiment of the invention herein disclosed consists of a cap constructed for attachment to the nipple of a collapsible tube and provided with an opening and a floating valve of cylindrical shape fitting within a counterbore formed in the nipple of the collapsible tube, and so arranged that after the cap is slightly moved away from the tube and on pressure being applied to the tube, the contents of the tube may be forced past the valve and out of the outlet opening of the cap. But when said cap is in closed position the contents of the tube cannot be forced past the valve, as the valve securely closes the opening in the nipple, also making it air tight and provides a secure seal.

With this and other objects of my invention in view, I hereafter describe the embodiments of the invention shown in the drawings and finally claim the same.

Similar characters of reference indicate corresponding parts throughout the various views.

In the drawings:

Fig. 1 is a central sectional view of a collapsible tube provided with a closure constructed in accordance with my invention, and with the cap in closed position;

Fig. 2 is a similar view with the cap in open position;

Fig. 3 is a plan view of the cylindrical valve;

Fig. 4 is a plan view of the washer having a circular opening, which opening is not necessary;

Fig. 5 is a plan view of the cap;

Fig. 6 is a central sectional view of another embodiment of Figure 1.

Referring to the drawings, the collapsible tube 10, shown in Figs. 1 and 2, and shown as broken away, may be of any suitable construction, as it is well known and heretofore generally used on the market.

The collapsible tube 10 is provided with a nipple 11 having screw threads 12 arranged exteriorly thereof and being provided with an annular recess 18' between the threads 12 and the end of the tube 10.

into which fits an annular spun lip 18'' of the cap extending inwardly from the lower edge of the cap 14. The cap 14 is provided with an elongated opening or slot 16 and with interior screw threads 15 engaging the exterior screw threads 12. The nipple 11 is provided with the usual, central bore for the discharge of the contents of the tube 10, and is recessed annularly within the bore at its upper end to form a cylindrical guiding bore 13, which may be slightly tapering outwardly. As shown in the drawing, the circumference of the guiding bore 13 is tapered upwardly and outwardly very slightly like the inverted frustum of a cone and adjacent to the circumferential wall of the bore 13 is arranged a substantially horizontal seat 19. On this seat is arranged a washer 18 of a diameter substantially equal to the smallest diameter of the bore 13, though it may be slightly smaller in diameter. In the event that the circumferential wall of the bore 13 is made cylindrical rather than conical, the exterior diameter of the washer 18 is substantially equal to the diameter of the bore, though it may be slightly smaller in diameter. Upon the washer 18 is arranged a cylindrical valve 17. The washer 18 is made of suitable material, such as compressed cork, rubber, stiffened paper or the like, and the valve 17 of any suitable metal. The exterior diameter of the valve 17 is substantially equal to that of the washer 18, so that in effect the washer 18 and valve 17 operate as if they were an entity. The upper portion of the valve 17 seats flatly against a plane portion of the under, interior surface of the cap 14. The diameter of the top of the valve is such as not to overlap the opening 16 of the cap.

When the cap 14 is in the position shown in Fig. 1, it presses the valve 17 and washer 18 downwardly tightly against the seat 19, making a perfect seal, and thereby prevents any of the contents of the tube 10 from passing between the valve and washer and the seat, so that a tight closure is obtained. The washer 18 and the valve 17 may, if desired, be made of one piece, instead of two, and may be composed in their entirety of metal, compressed cork or other suitable material, but I have found especially advantageous results to follow from the use of the rigid metallic member 17 and the yieldable material 18.

When it is desired to eject a portion of the contents of the container 10, the cap 14 is slightly rotated. By this rotation the cap 14 is removed from the valve 17 as the cap and valve are independent entities and not integral with each other. Pressure applied to the exterior of the tube 10 will then force the material in the tube against the cork washer 18 and raise the washer and valve 17 up against the flat under surface of the cap 14, thereby providing a passage between the washer 18 and the walls of the recess 13 through which the material may pass to the outlet opening 16 of the cap and hence be ejected from the tube. After a suitable quantity of the material has been ejected and it is desired to close the tube again, the cap 14 is rotated in the opposite direction until the washer 18 is seated on the seat 19 and held tightly thereagainst by the pressure of the valve 17 and the cap 14. The flat top of the cap and the flat surface valve abut against each other. The tapered circumferential wall of the bore 13 has the advantage that it enables the valve 17 and washer 18 to be readily guided into proper position, but I have found equally advantageous results to follow from a recess having a cylindrical circumferential wall. When a cylindrical recess is used, the valve 17 and washer 18 are guided in the cylindrical recess, and the material is squeezed out through the space between the washer 18 and valve 17 on the one hand, and the walls of the recess on the other and out of the orifice 16 as the valve is slightly smaller than the recess in the nipple.

In Fig. 3 I have shown a plan view, as heretofore stated, of the cylindrical valve 17; in Fig. 4 a plan view of the washer 18 and have shown a circular opening 18° in the washer which enables the squeezed material to get in between the washer and valve should the washer stick to its seat. But the opening is not essential and may be disposed with.

In Fig. 5 I have shown a plan view of the cap with the elongated opening 16 arranged at one side thereof.

In the manufacture of my improved closure, the hollow cap 14 may be made cylindrical with a knurled hard grip, and after it has been threaded upon the nipple 11, its lower end may be bent or spun inwardly to form the annular flange or lip 18". It will be apparent, however, that any desired method of making and assembling the parts may be employed without departing from the principles of the invention.

In Fig. 6 I have shown another embodiment, which follows quite closely the em-

bodiment of Figs. 1 and 2, but has the nipple provided with a circumferential depression forming a shoulder 41. By the downward movement of the cap 14 with the valve 17 and with its washer 18, the washer is pressed against the shoulder 41 and being of yieldable material is forced into the depression and hence gives a very tight fit so as to act as an efficient seal.

From what has been stated above, it will be noticed that the cylindrical valve is in continued engagement with its guiding recess 13 and moves with the material, as the material is forced out of the outlet opening 16; also that when the cap is closed it serves to secure a perfect seal.

I have shown various embodiments of my invention, the details of which may be changed without departing from the spirit thereof, as defined in the appended claims.

Having described my invention, I claim as new and desire to secure by Letters Patent:

1. A closure for collapsible containers comprising an outwardly threaded nipple having a central bore forming a passageway through it and an enlarged bore extending inwardly from its outer end providing a valve seat, a cap having a threaded engagement with said nipple and provided with a discharge aperture offset from its center, and a valve mounted in said enlarged bore in the nipple between the valve seat provided therein and the inner side of said cap.

2. A closure for collapsible containers, comprising an outwardly threaded nipple having a central bore forming a passageway therethrough and an enlarged bore extending inwardly from its outer end providing a valve seat, a cap having a threaded engagement with said nipple and provided with a discharge aperture offset from its center, and a valve and an annular washer loosely mounted in said enlarged bore in the nipple between the valve seat provided therein and the inner side of said cap.

3. A closure for collapsible containers, comprising an outwardly threaded nipple having an enlarged bore adjacent to its end providing a valve seat, a cap having a threaded engagement with the exterior of said nipple and provided with a discharge aperture offset from its center, and a valve and an annular washer loosely mounted between said nipple and said cap.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

HENRY M. FUSAY.